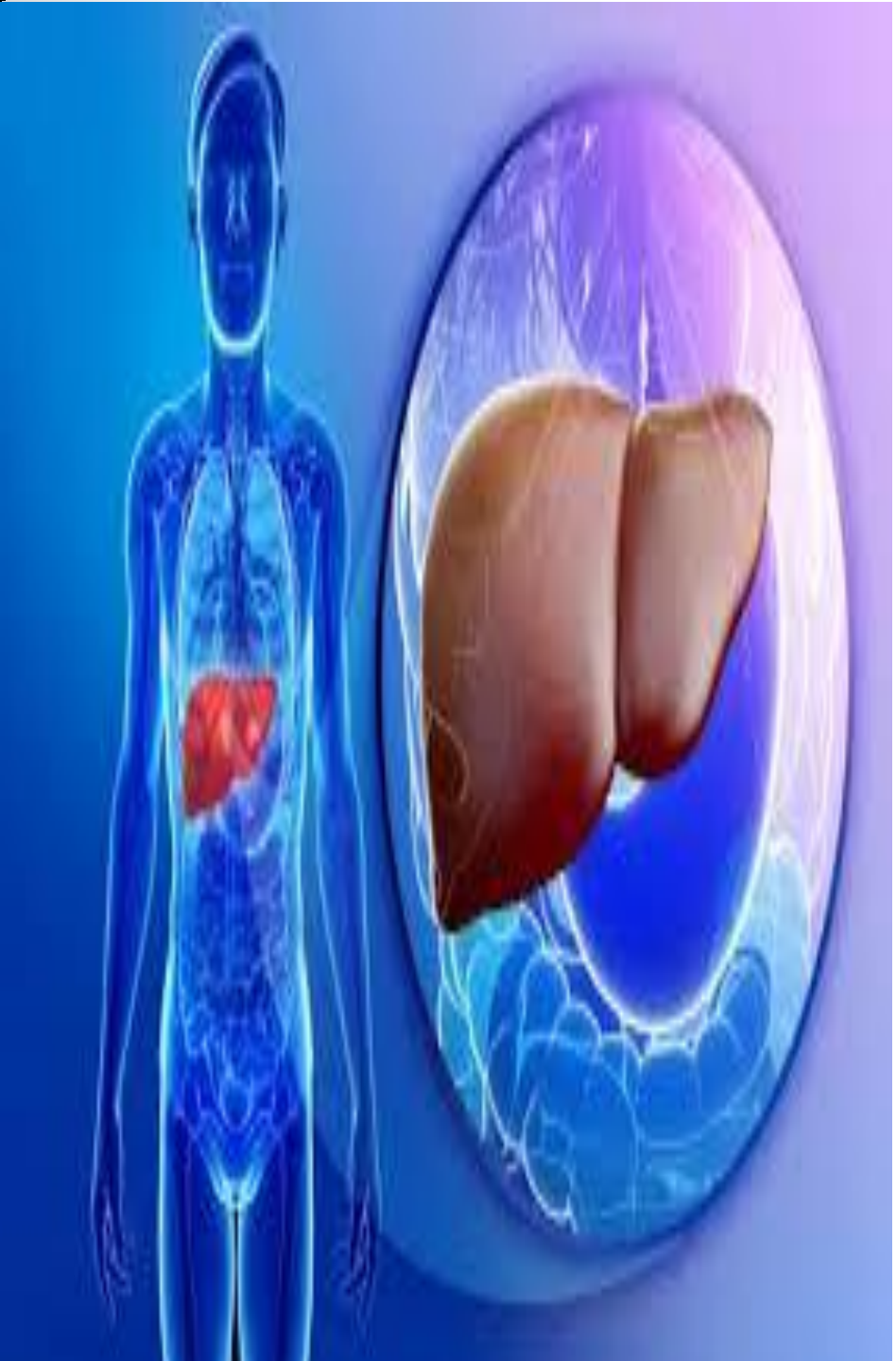

FUNCTION OF LIVER

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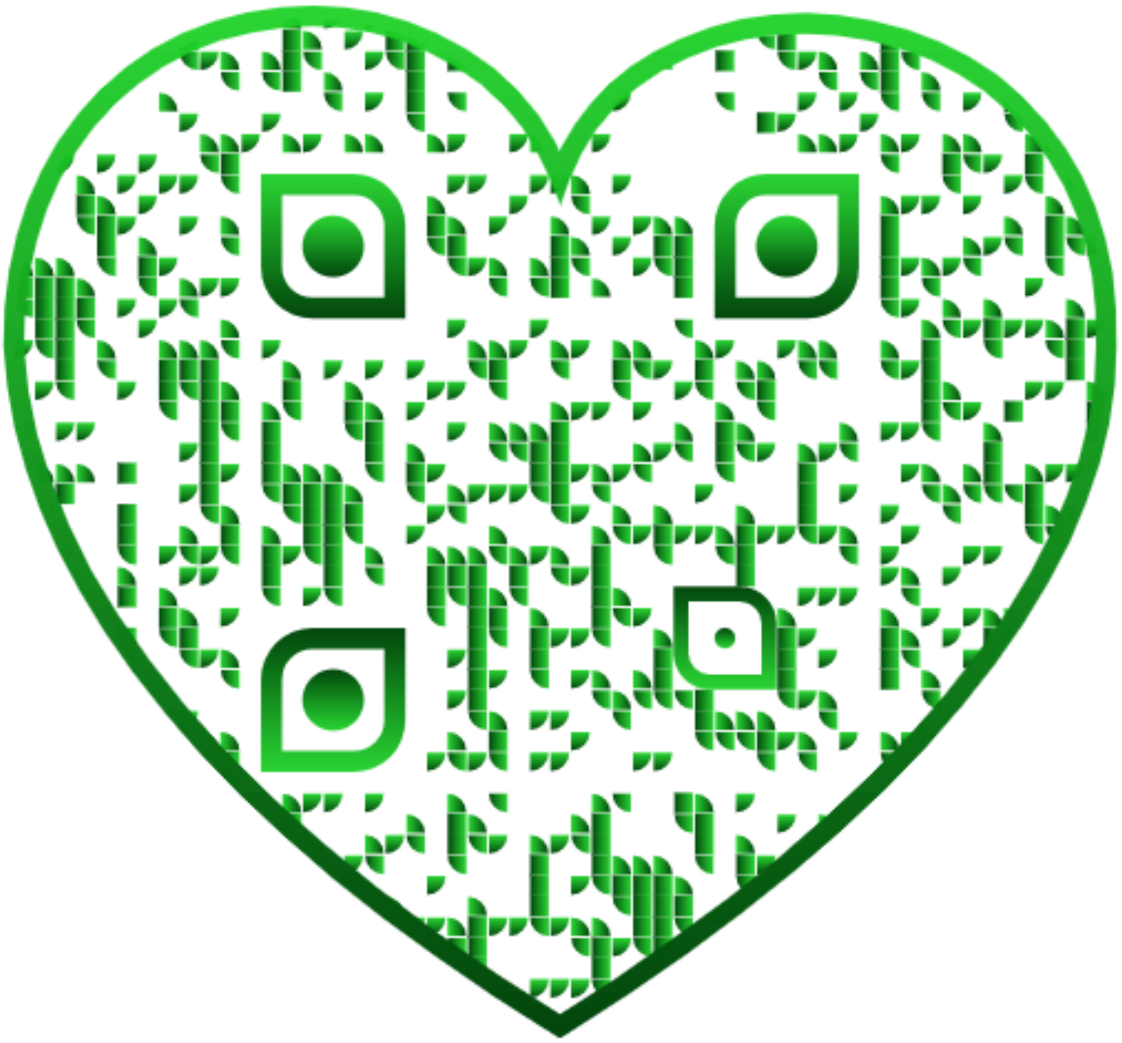


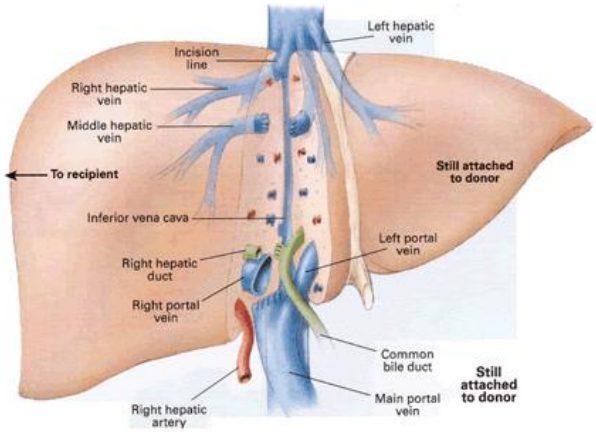
Liver: is largest organ and largest gland

- Redish brown
- Weight about 1.5 kg
- Located in the upper right quarter of the abdominal cavity

❖ FUNCTIONS OF LIVER :

- **The liver has more than 200 functions, including:**

  - **Bile Secretion and formation**
  - **Breakdown of erythrocytes**
  - **Detoxication**
  - **Storage of Nutrients**
  - **Synthesis of plasma Proteins**
  - **Synthesis of cholesterol**
  - **Metabolism of macromolecules**



Trotter, Wachs, Everson, Kam; *Medical Progress: Adult-to-Adult Transplantation of the Right Hepatic Lobe.* The New England Journal of Medicine. April 4, 2002. Vol. 346. Page 1074-1082. Copyright 2002, Massachusetts Medical Society. All rights reserved.

❖ Detoxication of Various Substances:

- Metabolic products of intestine microbes
- Exogenous toxins (medicaments, alcohol, poisons)
- Hormones (thyroxine, estrogen, cortisol, aldosterone)

❖ FUNCTION OF LIVER:

- **Formation and secretion of bile:**

- **Bile acids assists with digestion and absorption of fat and fat soluble vitamin in the intestine.**

- **Excrete waste products from the blood (bilirubin from hemoglobin break down), carries excess cholesterol out of the body**

❖ SYNTHESIS OF PLASMA PROTEINS:

Produced by RER of Hepatocytes

- • Acute-phase proteins
- • **Albumin:** main role is to maintain the osmotic pressure of the blood compartment , provide nourishment of the tissues.
- • **globulin:** play an important role in liver function; blood clotting, fighting infection.
- • **fibrinogen:** is the formation of fibrin that bind together platelets and some plasma protein in a hemostatic.

❖ CARBOHYDRATE METABOLISM:

A-the liver converts gelatos and fructose to glucose (which is the form that can be utilized by tie tissue cells)

B-the liver is essential for maintaining a normal blood glucose level[=glucostasis]if the if the blood glucose level increase the excess is taken by the liver and converted to glycogen [glycogenesis] and fat [lipogenesis] and if it decrease it is added by the liver into the bloodstream [through the processes of glycogenolysis and gluconeogenesis[

❖ Liver Acts As a Storage:

Vitamins, Minerals and Glucose

1_ Storage of vitamins;

- * Vit A >> which is important for (Vision, Proliferation, Mucus Secretion)....> Vit A decreasing cause "Nyctalopia" night bindness.

- * Vit D >> important for (bones and teeth)Vit D decreasing leads to "Ca++ inhibitions" therefore:
  - a_ Rachitis in children
  - b_ Osteoporosis in adults

- * Vit B12 >> important in RBCs production > Vit B12 decreasing cause "Pernicious anemia"

2_ Storage Of Minerals

* IRON >> important for RBCs synthesis> Lack of iron causes **Iron deficiency anaemia**

3_ Storage Of Glucose

* Liver stores about (100_120)g of glucose in the form of glycogen

❖ What metabolic pathways occur in the liver?

- Given these properties, the network involves all majorpathways active in liver, including gluconeogenesis, urea cycle, fatty acid metabolism, pentose phosphate, TCA cycle, and amino acid metabolism.

❖ How are proteins metabolized?

Protein metabolism occurs in liver, specifically, the deamination of amino acids, urea formation for removal of ammonia, plasma protein synthesis, and in the interconversions between amino acids.

❖ COAGULATION:

- synthesis of most of the coagulating factors.
- Vitamin K
- Factors II (prothrombin),
- VII (proconvertin),
- IX (Christmas factor),
- X (Stuart factor)

❖ FAT METABOLISM:

- Fatty acids synthesis
- Triglycerides synthesis
- Oxidation of fatty acids to supply energy for other body function
- Cholesterol Synthesis
- Ketone bodies synethsis
- VLDL & HDL synthesis
- Synthesis of fat from proteins and carbohydrates